REMARKS

This response is intended as a full and complete response to the Final Office Action dated September 11, 2003. In view of the amendments and the following discussion, the Applicants believe that all claims are in allowable form.

CLAIM REJECTIONS

A. 35 U.S.C. §103(a) Claims 1-8

Claims 1-8 stand rejected as being unpatentable over United States Patent No. 6,023,395 issued February 8, 2000 to *Dill et al.*, (hereinafter referred to as "*Dill*") in view of United States Patent No. 6,275,363 issued August 14, 2001 to *Gill,* (hereinafter referred to as "*Gill*"). The Applicants respectively disagree.

Independent claim 1 recites limitations not taught or suggested by the combination *Dill* and *Gill*. *Dill* teaches a magnetic single tunnel junction magnetoresistive read head having a first and second ferromagnetic layers separated by a barrier layer. *Gill* teaches a dual tunnel junction sensor having a free layer comprising ferromagnetic layers separated by an Ru spacer.

However, there is no motivation to modify the single tunnel junction sensor of *Dill* with the free layer of the dual tunnel junction sensor taught by *Gill*. It is impermissible to use the claims as a framework from which to choose among individual references to recreate the claimed invention. W. L. Gore Associates, Inc. v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (1983). Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 23 U.S.P.Q. 2d 1780, 1783, Fed. Cir. (1992); In re Gordon, 221 U.S.P.Q. 1125, 1127, Fed. Cir. (1984).

The rules applicable for combining references provide that there must be a suggestion from within the references to make the combination. Uniroyal v. Rudkin-Wiley, 5 U.S.P.Q. 2d 1434, 1438 (Fed. Cir. 1988)., In re Fine, 5 U.S.P.Q. 2d at 1599.

Additionally, MPEP § 2141.03 requires the Examiner to consider the prior art in its entirety. "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention". MPEP § 2141.03, W.L. Gore & Associates, Inc., v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed Cir. 1983), cert. denied, 469 U.S. 851 (1984).

Here, the Examiner has concluded that the motivation to combine *Gill* and *Dill* is to "...optimize 'in-phase scattering of conduction electrons in response to signal fields" as set forth in the abstract of *Gill*. The Applicants respectfully disagree.

Gill does not disclose a bias layer while it does disclose a free layer composed of a synthetic antiferromagnet ("SAF"). The reason *Gill* has no bias layer is that it is not required in a dual tunnel junction sensor.

As explained throughout *Gill*, when one has a dual tunnel junction sensor with a free layer sandwiched between two pinned layers, the two tunnel junctions respond differently and thus provide an "out of phase" response to external fields if the ferromagnetic and demagnetizing fields coupled to the free layer from the pinned layers are not "balanced" at the free layer. The goal of *Gill* is to balance the ferromagnetic and demagnetizing fields from the two pinned layers in order to provide an in phase response. As part of this effort, *Gill* requires that the free layer be an SAF because it is both thicker overall than a single-layer free layer of appropriate magnetization and because each of the thicknesses of its AP coupled layers may be independently optimized. Both a thicker free layer and the ability to independently adjust the thickness of the AP coupled layers are needed to "balance" ferromagnetic and demagnetizing fields coupled to the SAF free layer from the two pinned layers on opposite sides of the free layer. When the net ferromagnetic and demagnetizing fields from the pinned layers are balanced, each tunnel junction responds "in phase" to external fields. This is what *Gill* means by "in-phase scattering of conduction electrons in response to signal fields."

> "The linear bit density of the AP coupled free layer structure is improved over the typical single free layer. In the AP coupled free layer structure one of the AP free layers is thicker than the other AP layer resulting in a net magnetic moment of

the free layer structure which is designed to match the magnetization of the signal field from the rotating magnetic disk. This permits the thicknesses of the AP free layers of the AP coupled free layer structure to be optimized for in-phase scattering of the conduction electrons through the sensor. In contrast, a single free layer with a thickness that matches the magnetization of the free layer with the magnetization of high density signal fields from the rotating magnetic disk will be too thin to provide a thickness which optimizes in-phase scattering of conduction electrons through the sensor." See, *Gill*, at column 2, line 65 through column 3, line 12.

Thus, there is no motivation from within *Gill* to modify a single tunnel junction sensor, as described by *Dill*, to include an SAF free layer for balancing the performance of two tunnel junctions in a manner that would yield the subject matter of claim 1. In other words the Examiner is not considering either reference as a whole, as a single junction sensor does not have the balancing requirements of a dual tunnel junction sensor, and the SAF free layer taught by *Gill* for optimizing optimizes in-phase scattering of conduction electrons through a dual junction sensor is not required in *Dill*.

Moreover, *Dill* does not identify a need to replace or modify the free layer. Thus, there is no motivation from within *Dill* to modify a single tunnel junction sensor to include the SAF free layer of *Gill* for balancing the performance of two tunnel junctions, as a single junction sensor does not have the balancing issues addressed by *Gill*.

Therefore, there is simply no suggestion or teaching to combine these references. Optimizing "in-phase scattering of conduction electrons in response to signal fields" as suggested by the Examiner can not provide the motivation to combine references because *Dill* does not suggest the desirability of such a modification, and as the teaching of *Gill* solves a problem not associated with the sensor of *Dill*, and as such, *Gill* does not suggest a desirability for use of its structure in a single junction sensor. The Applicants submit that the Examiner's use of a desirability of optimizing "in-phase scattering of conduction electrons in response to signal fields" as a motivation to combine the references in the § 103 rejection is simply over reaching in light of

Uniroyal v. Rudkin-Wiley, In re Fine, In re Fritch, In re Gordon, W.L. Gore & Associates, Inc., v. Garlock, Inc., and MPEP §2141.02.

Thus, the Applicants submit that independent claim 1, and claims 2-8 that depend therefrom, are patentable over *Dill* in view of *Gill*. Accordingly, the Applicants respectfully request these rejections be withdrawn.

B. 35 U.S.C. §103(a) Claims 9-14 and 17-19

Claims 9-14 and 17-19 stand rejected as being unpatentable over *Dill* in view of *Gill*. In response, the Applicants have amended claim 9 to more clearly recite aspects of the invention.

Independent claim 9, as amended, recites limitations not taught or suggested by *Dill* and *Gill*. As discussed above, there is no motivation to combine the references.

Furthermore, *Dill* teaches a magnetic tunnel junction magnetoresistive read head having a first and second ferromagnetic layers separated by a barrier layer. *Dill* does not teach or suggest that the ferromagnetic layers are comprised of CoFe.

Gill teaches a dual tunnel junction sensor having a free layer comprising ferromagnetic layers separated by an Ru spacer. *Gill* does not teach or suggest that the ferromagnetic layers are comprised of CoFe.

As *Gill* does not teach or suggest selecting CoFe for the ferromagnetic layers, the teachings of Gill cannot be used to modify the head of Dill to yield a free layer comprising a synthetic antiferromagnet (SAF), wherein the SAF comprises a first ferromagnetic layer of CoFe, a second ferromagnetic layer of CoFe, and a spacer layer between the first and second ferromagnetic layers, wherein the first and second ferromagnetic layer and anti-parallel magnetic moments, as recited by claim 9.

Thus, there is no motivation from within *Gill* to modify a single tunnel junction sensor, as described by *Dill*, to include an SAF free layer for balancing the performance of two tunnel junctions in a manner that would yield the subject matter of claim 9 that includes a SAF having a first and second ferromagnetic layers of CoFe and a spacer layer disposed therebetween.

Thus, the Applicants submit that independent claim 9, and those claims depending therefrom, are patentable over *Dill* in view of *Bill*. Accordingly, the Applicants respectfully request these rejections be withdrawn.

NEW CLAIM 20

New claim 20 has been added to more clearly recite aspects of the invention. The Applicants believe that no new matter has been added, and accordingly, request allowance of this claim.

CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If, however, the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Mr. Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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